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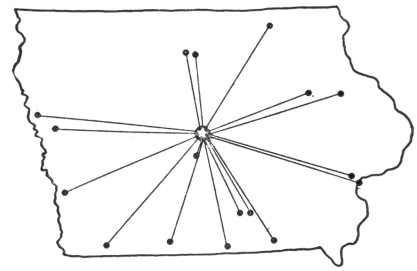
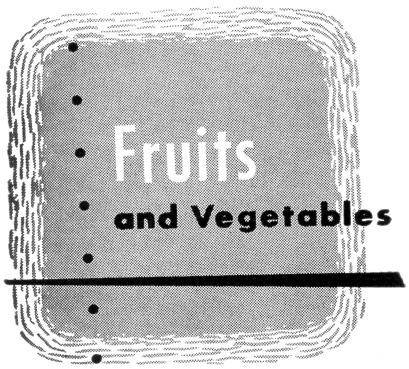
Your Experiment Station Reports

Iowa Farm Science Editorial Board

YOUR EXPERIMENT STATION REPORTS . . .





Grape Root Development Depends on Soil Type

How WELL grape roots develop on loess soil depends on the soil type, say Chris Doll and H. L. Lantz of the Iowa Agricultural Experiment Station. Doll and Lantz made extensive excavations to study grape root development on Ida and Monona soils at the Bluffs Experimental Fruit Farm.

Excavations of the root systems of two 7-year-old Concord grape vines showed an extensive root system ranging from 22 feet long to 14.5 feet deep in a Monona silt loam, and a sparse root system ranging from 24.2 feet long to 9.5 feet deep on an Ida silt loam. The sparse root system has only two main roots in contrast to many roots in the extensive root system. Soil tests for the area around the plants showed that nitrogen, phosphorus and potassium could be a limiting factor in root development. Soil texture in the sub-soil also seemed to influence the growth habits of grape roots.

New Scab-Resistant Potato Variety Released

OSAGE, a new scab-resistant, baking-type potato variety has been released jointly by the Iowa Agricultural Experiment Station and the USDA. In trials at Clear Lake over a period of 6 years, Osage has produced an average of 450 bushels per acre of U.S. No. 1 potatoes compared with 394 bushels for Cobbler. The new variety has also produced a higher percentage of U.S. No. 1 tubers, reports C. E. Peterson who directed the tests. Cooking quality of Osage is also good as indicated by the average content of total solids for the 6 years. However, this variety is susceptible to hollow heart under certain conditions.

Cherokee, the new variety introduced in 1950 by the USDA and the Indiana Station, has continued to gain in popularity. In 1953 trials at Clear Lake, Cherokee gave its poorest performance in 5 years of continuous testing. However, commercial plantings in many locations have proved the value of Cherokee as an early, high-quality variety highly resistant to scab and late blight.

Grape root development on loess soil depends on the soil type. Research at the Bluffs Experimental Fruit Farm indicates lack of nitrogen, phosphorus and potassium could be a limiting factor in root development. Soil texture and sub-soil also influence root growth.

Resistance to disease is being incorporated into potentially new potato varieties as rapidly as possible. Parents used in the crossing program are evaluated for resistance to late blight, virus X and other diseases. Seedling populations are screened for late blight resistance at as early a stage as possible. This screening for resistance to virus X in the seedling stage is a new development in the breeding program.

Future plans for the potato breeding study include breeding for disease resistance to virus Y, leaf-roll and virus A. Parents having resistance to the most virulent races of late blight will be used. This way, that type of disease resistance can be combined with resistance to scab and other diseases.

New Onion Hybrids Released and Named

A NUMBER of new onion hybrids have been named and released cooperatively by the Iowa Agricultural Experiment Station, other state experiment stations and the USDA under the National Onion Breeding Program.

Some of these hybrids are: Abundance, Elite, Champion, Encore, Contender, Bonanza, Epoch, Surprise and Aristocrat. The first five hybrids — Abundance, Elite, Champion, Encore and Contender —are adapted where Early Yellow Globe is grown. They will store as well as or better than Early Yellow Globe. The remaining four hybrids — Bonanza, Epoch, Surprise and Aristocrat— are storage hybrids which will exceed Brigham Yellow Globe and related strains in keeping quality. All of these new hybrids are superior to open-pollinated varieties of the same type in such important characteristics as uniformity, color and scale retention.

The foundation inbred seed was produced at Ames. The pollen parents of all nine new hybrids were released jointly by the USDA, the Iowa and Idaho Agricultural Experiment Stations in 1952. These inbred lines are being increased by seedsmen who will have seed of several of the new hybrids in commercial production by 1955. In yield trials at Clear Lake, all nine hybrids had greater yields per acre than Brigham Yellow Globe or Iowa Yellow Globe 44. Abundance produced the greatest yield — 1,356 bushels per acre compared with 859 bushels for Iowa Yellow Globe 44. Elite was second with 1,228 bushels per acre.

Storage tests were conducted at Clear Lake to determine storage quality of 80 experimental hybrids. The effect of maleic hydrazide on keeping quality was studied using treated and untreated samples of 50 different hybrids. This chemical, applied 2 weeks before harvest, delayed sprouting but didn't influence any other storage losses. There was no advantage observed for the treated samples until after March 1 when the untreated samples started to show more top sprouting than those treated.

The studies were made by C. E. Peterson, W. J. Hooker and R. L. Plaisted.

Aldrin Controls Sweet Potato Wireworms— But Reduces Yield

PREVIOUS RESEARCH at Muscatine Island Field Station has shown that aldrin applied in the transplant water effectively controls wireworms in sweet potatoes. However, it reduces the potato yield. Observations made this year on the Island showed some reduction in yield when aldrin was used at 1, ½ or ¼ pound per acre. Wettable powders caused less injury than when aldrin was used in the form of an emulsion. All treatments gave almost 100 percent control of wireworms while 23.2 percent of the sweet potatoes in the untreated plots were injured. This work was conducted by W. D. Fronk and Lewis Peterson.

Pink Root Fungus In Onions Studied

HARD, STORAGE ONIONS with resistance to pink root are needed for the northern onion growing areas. C. E. Peterson and associates of the Experiment Station studied suitable ways to evaluate pink root resistance in onions at controlled soil temperatures. Seedling plants and rooted bulbs were tested for resistance to the pink root fungus. Although it's too early to determine the extent of progress, it's very probable that pink root resistance can be incorporated into hard, storage onions.

Thrips resistance studies and genetic studies of canary yellow bulb color are also in process.

Study Controls for Insects and Disease In Home Gardens

HOME GARDENS have insect and disease problems, too. Several commercial mixtures offered on the market for multi-purpose insect and disease control in the home gardens were tested on beets, beans, peppers and cabbage at Ames.

W. D. Fronk and E. P. Lana of the Experiment Station, who were in charge of the tests, report the following results. Yield from the bean plots was uniform. This was surprising since the untreated bean plots were heavily infected with potato leafhoppers. Peppers, a crop that usually doesn't show much response to insecticides, produced a heavier crop in all of the treated plots than in the untreated plots. All the treated cabbage plants showed great improvement over the non-treated plants and the yield was much greater in the treated plots than in the plots not treated. The number of insects on the beets was too small to make comparisons.

The insect and disease control mixtures tested were from Standard Oil, Thompson-Hayward, Geigy and Penick.

Insecticides Help Muskmelon Crop

MUSKMELON, resting on the ground, is often injured by larvae of the cucumber beetle boring into the rind. Previously, sprays of various insecticides on muskmelons grown at the Muscatine Island Farm caused a significant reduction in this injury, but this year the reduction was not significant. Lindane seemed to give the best control of the beetles when judged by the number of vines killed by bacterial wilt, which is transmitted by the beetles. The

yield in weight and number of fruits was also highest in lindane-treated plots. The insecticides used in these tests were heptachlor, methoxychlor and lindane, report Lewis E. Peterson and W. D. Fronk of the Iowa Agricultural Experiment Station who directed the tests.

Several chemicals have been tested during the last three seasons to determine their value for weeding muskmelons. These tests show that a pre-emergence spray of N-1 naphthylphthalamic acid at 4 pounds per acre is a practical supplement to hand weeding.

Four fungicides were compared on muskmelons for the control of leaf diseases. Three seasons' results show no profitable yield increase from the use of fungicides.

Crop Diseases May Be Forecast

FORECASTING the development of crop diseases may soon be a reality. In fact, though most of the studies are still in the preliminary stages, actual potato late-blight forecasting in the north-central states was attempted for the third year in 1953.

During the period June 20, 1953, to September 25, 1953, seven late-blight forecasts for central and north-central Iowa were included in the regional predictions. The Iowa predictions were developed from hydrothermograph data obtained from Ames and Clear Lake. The predictions proved correct for both the Clear Lake and Ames areas.

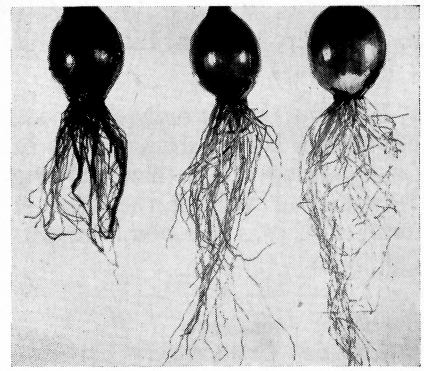
For the most part, however, the studies are exploratory and related to the causes of potato-to-mato late blight. Three types of experiments are in progress—fundamental laboratory studies, greenhouse studies, and field studies.

In the laboratory, a dew recorder was developed. This recorder might become a basic instrument in late-blight forecasting. Also, additional isolates of the potato-tomato late-blight fungus were obtained. In the greenhouse, potato and tomato plants were sprayed with suspensions of single-cell isolates of the late-blight fungus, and the effects were studied. In the field, the influence of temperature, relative humidity, dew, solar radiation and rainfall on the establishment of the late-blight fungus was studied.

These studies are under the direction of J. R. Wallin of the Iowa Agricultural Experiment Station in cooperation with the USDA.

Watermelon Varieties Tested on Iowa Soil

TRIAL PLOTS of several watermelon varieties were planted on both wilt and wilt-free soils at the Muscatine Island Farm. Results show that Chris-Cross was a little better than Blacklee, though both varieties performed well. Calhoun Sweet produced well but isn't suitable for long-distance shipping because of its tender rind. USDA-51-27, a new wilt-resistant, long-ray melon, seemed to be a promising variety for Iowa.



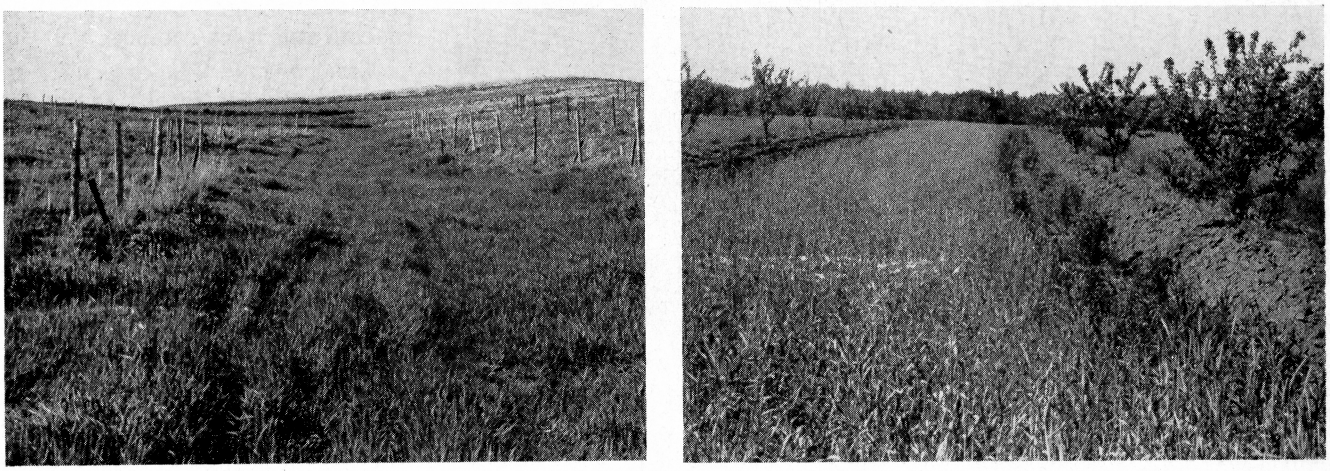
Iowa State College horticulturists are seeking to incorporate resistance to pink root fungus into hard, storage onions. Onions, shown from left to right, are susceptible, intermediate, and highly resistant.

Fertilizer side-dressings on watermelons at the farm showed that 50 pounds of nitrogen produced the highest yields for the past 4 seasons. However, in 2 years out of the 4, the yields from nitrogen side-dressing were not much better than those from no side-dressing at all.

This research was directed by Lewis E. Peterson of the Iowa Agricultural Experiment Station.

Get More Peas From Planned Seed Spacing

STUDIES on pea spacing at the Experiment Station show that the combination of closest spacing and heaviest rate of seeding produces the greatest total number of peas and pods per area of ground.



LEFT: A waterway between experimental vineyards at the Bluffs Experimental Fruit farm. The bromegrass offers protection against erosion. RIGHT: Apple trees on terrace ridges at the Bluffs farm with a rye cover crop between rows. Rye is permitted to ripen and seed and is disked down in July. Rye is then reseeded and provides a growing cover throughout the fall, winter, spring and summer months.

This means spacing the rows 6 inches apart and spacing the seeds 1 inch apart.

However, if you reduce the seed population by planting 2 rows of seeds as above and then omitting 2 rows, you will get the greatest number of peas per pod and pods per plant.

Fertilizer Increases Cut Sweet Corn Yield

APPLICATIONS of 0, 60 and 120 pounds of actual nitrogen, 0, 60 and 120 pounds of P_2O_5, and 0 and 60 pounds of K_2O in all possible combinations in which one or more were used before planting sweet corn showed profitable increases in the yield of cut corn. These tests were made at Ackley under the supervision of E. P. Lana and John Pesek of the Iowa Agricultural Experiment Station.

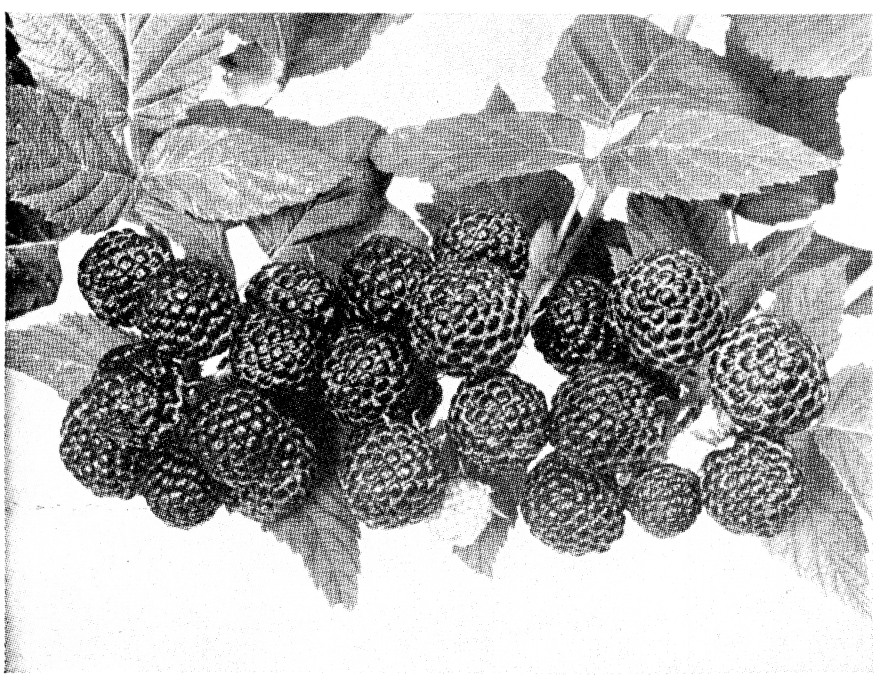
Although the fertilizer applications increased the cut corn yield in 1953, they didn't produce much increase in the gross yield. The same results were seen with hill fertilizer. The yield of cut sweet corn from the hill-fertilized plots was much greater than that of the plots receiving no hill fertilizer. But there were no differences in gross yield between the plots receiving hill fertilizer and those receiving no hill fertilizer.

In tests at Vinton, side-dressings of nitrogen at 0, 100 and 200 pounds (33-0-0) per acre were applied at two dates: (1) between first and second cultivation and (2) at lay-by cultivation. At the first application date, the increase of gross yield and cut-corn yield corresponded with the rate of fertilizer application. Side-dressing at the later date produced the poorest return in all categories.

In another phase of the sweet corn study, ear size decreased as plant stand increased from two to six per hill. The percent of cut corn decreased as plant number per hill increased.

Small-Seeded Lima Bean Types Best in Drouth

THE SMALL-SEEDED lima bean varieties Clarks Bush and Limagreen produced satisfactory yields under heat and drouth conditions. The large-seeded types didn't produce satisfactory yields. This is the result of a lima bean variety trial conducted by E. P. Lana of the Iowa Agricultural Experiment Station. The study was done in cooperation with the USDA.



Black Hawk, a new black raspberry for the Midwest, was announced and released by the Iowa Agricultural Experiment Station in 1954. And article describing Black Hawk and furnishing details about it and its record of performance was published in the December Iowa Farm Science.

Large-seeded lima bean types were shown to lack resistance to heat and drouth conditions. Scant or no yields at all were obtained from these types, and blossom drop was excessive during the blooming season.

Commercial Tomato Varieties Studied

FIVE COMMERCIAL tomato varieties, two hybrids and four Iowa selections were grown in a tomato variety study conducted by E. P. Lana and W. J. Hooker of the Experiment Station. Some varieties studied were Cavalier, Sioux, Rutgers, Earliana x Jubilee and the Iowa selection 52-103.

Cavalier showed promise as an early market type. Sioux exhibited drouth resistant qualities. The hybrid Earliana x Jubilee was among the top producers for early yield. Iowa Selection 52-103 performed similarly to Rutgers in total yield and maturity range, but fruit size was considerably larger, with thicker flesh and less cracking.

Vegetable Crops May Be Improved By Breeding Studies

BREEDING STUDIES to improve vegetable crops for canning are being conducted by E. P. Lana and W. J. Hooker of the Experiment Station. Some of the results of these studies are:

Pumpkin: Cangold pumpkin, a new selection of Kentucky Field, was released. Seed was made available to interested seed producers and Iowa canners.

Lima beans: The extreme heat and drouth conditions last summer eliminated a large number of lima bean selections of the large seeded types. Several types were saved that appeared to have outstanding production. Crosses will be made to increase the breeding material.

Tomatoes: Selection was continued from high color lines based on chemical and visual tests. Several lines now having commercial size and type will be included in the variety trial in 1954. Studies are also being conducted on tomato cracking and morphological sterile transfer.